Work Instruction (WI)

DIRECTIVE NO.	270-WI-7060.0.1D	**APPROVED BY Signature:**	*Original Signed By*
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EXPIRATION DATE:	September 5, 2019	**TITLE:**	Chief, Information and Logistics Mgmt. Div.

COMPLIANCE IS MANDATORY

Responsible Office: Code 270/Information and Logistics Management Division

Title: Project Logistics Support

PREFACE

P.1 PURPOSE

This procedure describes the policies and procedures that guide the Information and Logistics Management Division (ILMD) support of Goddard projects, and includes the full spectrum of project logistics support; including the following: logistics planning and coordination; transportation engineering analysis; shock and vibration instrumentation services; transportation of flight hardware and critical ground support equipment; equipment storage; procurement of services, materiel, and equipment; project parts support; specialized packing and crating; export/import control; hazardous materials support; and property accountability.

Project customers have the option to gain access to these resources through an ILMD Project Logistics Manager who identifies support opportunities and coordinates the efforts of ILMD functional experts needed to support the specific requirements for each project. This procedure supplements the guidance contained in GPR 6400.1, GPR 8700.2 and GPR 8730.1

P.2 APPLICABILITY

This procedure applies to the ILMD support of Goddard projects under the scope of GSFC's Management System (MS). Code 274 provides overall management of the ILMD project support function and is supported directly by designated Project Logistics Managers and through the matrix support of all functional areas of the ILMD.

P.3 REFERENCES

a. DLA Regulation 4145.7, Packaging of Materiel
b. MIL-STD-2073-1, Standard Practice for Military Packaging
c. NPD 8730.1, Metrology and Calibration
d. ANSI/NCSL, Calibration System Compliance - Requirements
e. AS9100, Quality Management Systems – Aerospace - Requirements
f. ISO 9001, Quality Management System - Requirements
g. GPR 1410.2, Configuration Management
h. GPR 1710.1, Corrective and Preventive Action

i. GPR 3410.2, Employee Task-Specific, Required and Mandatory Training Requirements
j. GPR 5340.2, Control of Process Nonconformances and Customer Complaints
k. GPR 6400.1, Logistics Support
l. GPR 8700.2, Design Development
m. GPR 8730.1, Calibration and Metrology
n. 270-WI-4200.0.1, Equipment Management
o. 270-WI-4520.2.1, Receiving Project Parts
p. 270-WI-5100.1.2, Procurement
q. 270-WI-5310.4.1, Identification and Traceability of Project Parts
r. 270-WI-5330.0.1, Inspection and Test of Project Parts
s. 270-WI-5340.2.1, Control of Non-Conforming Project Parts
t. 270-WI-6400.1.1, Packaging and Preserving NASA Material and Equipment
u. 270-WI-6400.1.2, Transporting Material for Space Flight and Scientific Projects
v. 270-WI-6400.1.3, Storing Project Material and Equipment
w. 270-WI-6400.1.4, Packaging and Marking of Project Parts
x. 270-WI-6400.1.5, Storage of Project Parts
y. 270-WI-6400.1.6, GSFC Export Control Office
z. 279-PLAN-1700.1.2, Hazardous Materials Management Plan
aa. GSFC 4-34, Nonconforming IMTE Tag
bb. GSFC Form 20-4, Transfer/Shipping Request
cc. Safety Data Sheet (MSDS)

P.4 CANCELLATION

270-WI-7060.0.1C, Project Logistics Support

P.5 TOOLS, EQUIPMENT, AND MATERIALS

a. Transporter Systems – list of systems is contained on the “Transporter Systems Equipment Matrix”
b. Scheduling software
c. Specialized tools, equipment and materials will be specified by individual space flight projects

P.6 SAFETY PRECAUTIONS AND WARNINGS

All planning and operations related to project support shall stress personnel safety and measures to reduce the risk of damage to equipment and material. Planning documents shall include or reference specific safety measures, where appropriate. Operation-specific safety precautions are contained in referenced directives, work instructions, and subject-specific regulations and instructions, as well as operational documents such as Transportation Plans, Instrumentation Plans and Memoranda of Understanding (MOU).

Lifting Safety: Personnel safety is of extra concern during operations where property is lifted or lowered whether by mechanical or manual means. The following safety precautions will be observed during these operations:

- Safety shoes must be worn. Hard hats must be worn if working under and around suspended loads.
- The area around the lifting/lowering operation must be clear of unnecessary property and personnel, provides good footing/traction and is free of trip hazards.
- When lifting material to and from racks above floor level, a forklift with a permanently installed overhead guard must be used.
- A sufficient number of qualified personnel must be assigned to the lifting/lowering operation including extra personnel to assist with manual operations and a dedicated "spotter" to assist forklift operators handling loads that obstruct the driver's unrestricted vision. Spotters will remain well clear of elevated loads at all times.
- Ensure that the load destination is clear of obstacles and provides a stable base to support the load.
- All forklifts used for critical lifts must have a current weight test certification unless a formal waiver has been issued and is readily available to equipment operators.
- A daily safety checklist must be initialed each day before the first use of any forklift or battery powered hand truck.
- For critical lifting operations, manual lifting/lowering shall be restricted to a maximum 35 pounds.
- For critical lifts, project customers will provide a verified Critical Procedure and/or Work Order Authorization specific to the lifting operation being conducted and a pre-task briefing will be conducted. Code 270 personnel involved in the lifting/lowering operation will review procedures and WOAs for compliance with NASA and Goddard requirements.

Material Stability: Material that is stored in racks above floor level must be stored in a manner that assures the stability of both the material and (when used) the pallet on which it is stored. Three specific steps must be taken to ensure material stability:

- The material itself must be arranged in a stable configuration. Heavy items on the bottom, light items on the top, boxes/material stacked in a manner that prevents collapse of bottom material, etc. Whenever possible, palletized material will be shrink-wrapped or otherwise secured to the pallet (e.g., metal banding).
- Palletized material must not overhang the edge of the pallet
- Pallets may not overhand the edge of storage racks by more than 3 inches on either the front or back edge of the rack.

P.7 TRAINING

All employees performing this function shall be required to attend specific on-the-job training for the procedures contained in supporting work instructions. Training for Government employees will be documented in accordance with GPR 3410.2. Training for support contractor employees shall be recorded in the contract-training database and individual certifications (e.g., Commercial Driver's License or Electro-Static Discharge certification) shall be filed in each employee's personnel file.

Training Title	Required for…	Periodicity	Instructor
270-WI-7060 Project Logistics Support OJT	Mechanical Engineers	One Time	Transportation Manager
270-WI-6400.1.1 Packaging and Preserving NASA Material and Equipment OJT	Mechanical Engineers	One Time	279 Transportation Manager
270-WI-6400.1.2 Transporting Material for Space Flight and Scientific Projects OJT	Mechanical Engineers	One Time	279 Transportation Manager
270-WI-6400.1.3 Storing Project Material and Equipment OJT	Mechanical Engineers	One Time	274 Storage Manager
270-WI-6400.1.8 Space Flight Transportation Support Equipment Maintenance Plan OJT	Mechanical Engineers	One Time	Lead Mechanical Engineer
270-WI-6400.1.9 Process for Electrostatic Discharge (ESD) Control OJT	Mechanical Engineers	One Time	279 Project Parts Warehouse Lead
PACK-1A-DL Military Preservation and Packaging for Storage and Shipment	Mechanical/Packaging Engineer	One Time	On-line (http://ammo.okstate.edu)through US Army Defense Ammunition Center @McAlester, OK
PACK-1B Military Preservation and Packaging for Storage and Shipment	Mechanical/Packaging Engineer	One Time	US Army Defense Ammunition Center @McAlester, OK
49 CFR/IATA/IMDG	Mechanical/Packaging Engineer	Biannual	Commercial Vendor
Forklift Train-the-Trainer	Mechanical/Packaging Engineer	One-Time	Commercial Vendor
Instrumentation OJT	Mechanical Engineer	As required	Instrumentation vendor
ARC-001-06 Compressed Gas Safety	Mechanical Engineers	One Time	On-line from NASA Learning Center – htpps://satern.nasa.gov
Contractor's Export Control Training	Mechanical Engineers	Annual	On-line from Contractor's Learning Center

P.8 RECORDS

Record Title	Record Custodian	Retention
GSFC 4-34, Nonconforming IMTE Tag	Mechanical Engineer	*NRRS 6/2C Destroy 6 years after the period of the account.
GSFC Form 20-4, Shipping/Transfer Request	Lead Mechanical Engineer	*NRRS 6/2C
Storage Information Management System (SIMS), which includes Storage Requests and Storage Out Requests	Storage Manager	*NRRS 6/2C
Project Folder – contains the documentation described in Section 2.8 Document Control	Lead Mechanical Engineer	*NRRS 6 2C

** NRRS – NASA Records Retention Schedule (NPR 1441.1)*

P.9 MEASUREMENT / VERIFICATION

Functional Area	Description	Measurement
SOW 3.0 Project Logistics	All logistics and engineering activities shall be completed on schedule.	Lead Mechanical Engineer compares all actual to required completion dates, deadlines, customer required completion dates contained in the Project File
SOW 3.3 Packing and Crating	All material and equipment shall be packaged properly to withstand all foreseen climatic and environmental conditions, stacking weights, modes of shipment, and long-term storage by various carriers.	Mechanical Engineer inspects 10 percent of outgoing shipments for compliance with MILSTD-2073-1 and the 20-4
SOW 3.0 Project Logistics	Maintain 95 percent of the active inventory of shock and vibration instrumentation hardware and weighing devices so that they are calibrated and ready for immediate service	An examination of the calibration due dates will be made to determine whether the items are past due for calibration.

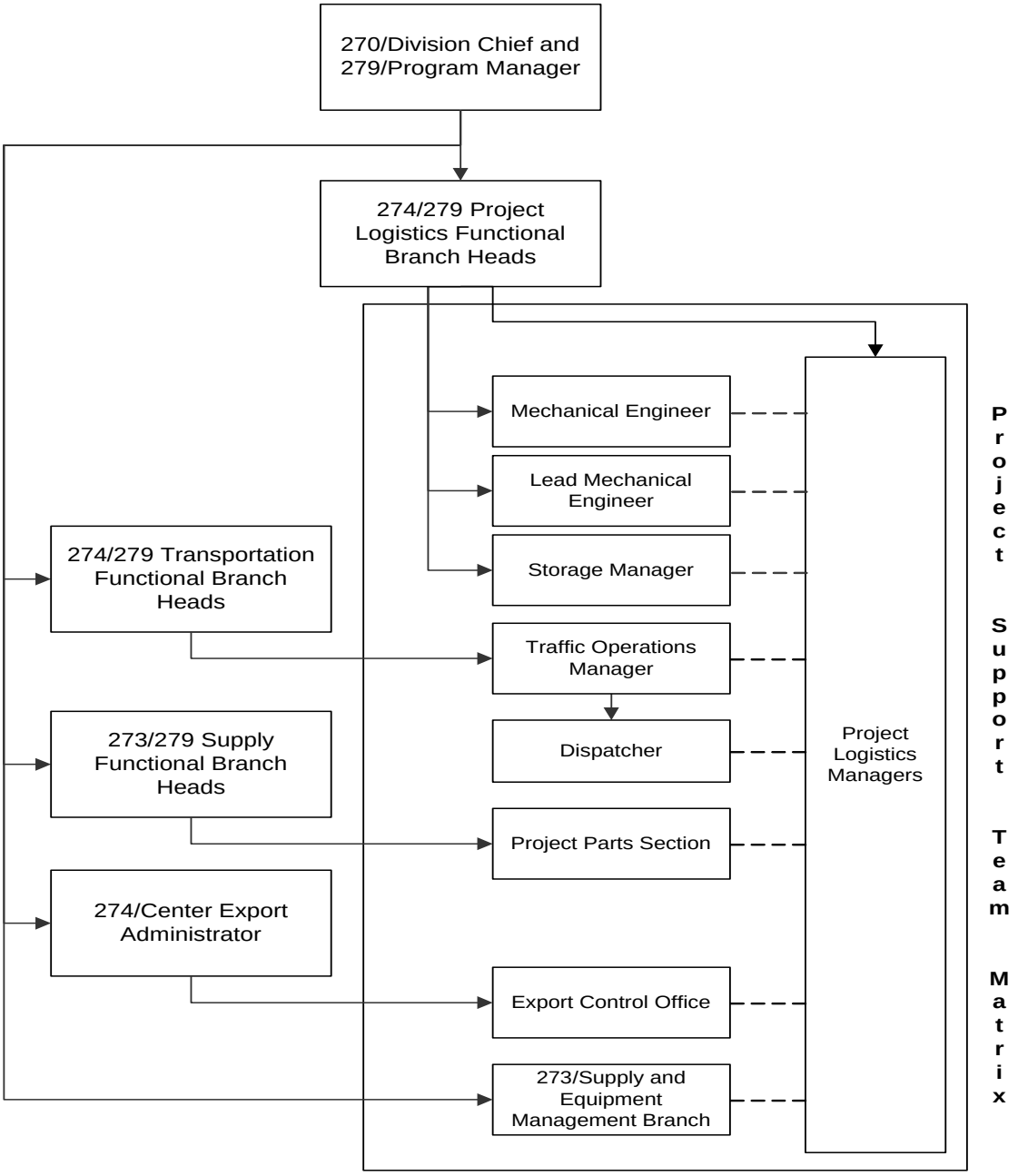
INSTRUCTIONS

In this document, a requirement is identified by "shall," a good practice by "should," permission by "may" or "can," expectation by "will," and descriptive material by "is."

1.0 RESPONSIBILITIES

The ILMD contains a matrix organizational element dedicated to identifying and coordinating logistics support for project customers. When complex project logistics support requirements are identified, Project Logistics Managers, working under the technical direction of the Project Logistics Branch Head, serve as the primary points of contact to coordinate logistics support for project customers across all functional elements of the Information and Logistics Management Division. As dictated by the details of support requirements, the Project Logistics Manager will identify and coordinate a cross-functional Project Support Team, consisting of appropriate logistics functional experts, that provides the necessary spectrum of logistics functions. Overall responsibility for each functional area remains under the direction of the respective Code 270/279 Functional Branch Heads who are responsible for providing responsive services to a wide variety of project and institutional customers. Resource and priority conflicts between project and institutional customers as well as contending technical and operational approaches recommended by individual Project Support Team members shall be resolved cooperatively by the Project Logistics Branch Head, cognizant Functional Branch Heads and the Project Logistics Managers. This organizational arrangement is depicted in Flowchart 1 and described in detail in the responsibilities that follow.

Flowchart 1: Code 270 Project Support Organization



1.1 Project Logistics Branch Head

The Code 274 Logistics and Transportation Management Branch Head shall serve as the overall Project Logistics Branch Head and shall exercise overall management of project support activities. In addition, the Project Logistics Branch Head shall work as a consultant directly with projects in describing and promoting Code 270's project support capabilities.

a. Shall direct assignment and provide technical oversight of Project Logistics Managers and the backup Project Logistics Managers. In the case of the Code 273 Supply Manager, who may also function as a Project Logistics Manager, technical oversight will be provided by the Code 273 Branch Head. Shall ensure that a standard approach to project support management will be practiced by the assigned Project Logistics Managers. The Project Logistics Branch Head, as necessary, shall authorize exceptions to this approach.

b. Screens new project support requirements to determine the appropriate level and type of Code 270 support, and determines the need for a Project Logistics Manager and a dedicated, matrixed Project Support Team (Section 2.2).

c. Manages the overall process for risk management (Section 2.4).

d. Recommends to Code 270/279 management the prioritization of resources from the Information and Logistics Management Division to support project requirements (Section 2.5).

e. Resolves contending intra-Code 270 technical approaches concerning project support requirements (Section 2.5).

f. Manages high-level financial requirements (Section 2.6).

g. Manages the overall process for documentation management and control (Section 2.8).

h. Manages the overall system of information tools used to manage project support activities, including the Project Support Matrix.

i. Regularly contacts major project customers to assess the adequacy of Code 270 support.

j. Authorizes deviations to the provisions contained in this work instruction.

1.2 Project Logistics Manager

The Project Logistics Manager shall serve as the primary ILMD point-of-contact for designated GSFC project customers for the planning and coordination of ILMD resources. In addition, the Project Logistics Manager works as a consultant directly with projects in describing and promoting Code 270's project support capabilities and shall provide the following:

a. Manages the logistics coordination process for assigned projects (Section 2.3) including updates to any task/action item lists developed for each assigned project. When appropriate, the overall management of the integrated project support effort will be documented (see Section 2.2 and example in Attachment 2) and high-level (primary tasks) time lines will be available for Code 270 management review. The Project Logistics Branch Head will authorize any exceptions (Section 1.1a).

b. Establishes and manages activities of the matrix Project Support Team, including:

1. Providing overall coordination;
2. Identifying priorities;
3. Ensuring that team members are kept apprised of project status and informed of events requiring their attendance and participation;
4. Coordinating development of project support documentation;
5. Coordinating resolution for contending technical approaches advocated by individual Project Support Team Members, and elevating unresolved issues to the Project Logistics Branch Head (Section 2.5); and
6. Coordinating project support related travel (Section 2.7).

c. Reviews logistics support elements to ensure that project customers are offered support to the full extent required. Informs the project of any areas where additional support may be recommended or would add value/reduce risk to the project.

d. Advises projects when reimbursable funding through the financial accounting string or purchase requests are necessary for specific Code 270 support actions as described in the Financial Management process (Section 2.6).

e. Expedites the identification and resolution of all project logistics issues and follow-ups with the projects to ensure that the customer is satisfied.

f. Maintains coordination of Code 270 activities during pre-operational, operational, and post-operational project stages to ensure integrated and responsive Code 270 support to the project, maintains a project-specific task/action item list, and directs the timely completion of required project support documentation (e.g., Project Logistics MOU's, Transportation Plans and Reports, and Instrumentation Plans and Reports).

g. Provides logistics expertise for development of RFP specifications, terms, and conditions. Reviews and provides input of contractor submitted proposals, specifically focusing on their proposed logistics approach and the resulting cost and schedule impacts.

1.3 Backup Project Logistics Manager

For designated projects, a Backup Project Logistics Manager may be assigned. The Backup Project Logistics Manager provides support to the Project Logistics Manager and shall serve as the Project Logistics Manager in that individual's absence. The Backup Project Logistics Manager shall perform the following:

a. Attends initial planning meetings and participates in regular status meetings with the Project Logistics Manager to maintain currency with project requirements and issues.

b. Receives copies of all pertinent e-mails and documents relating to project requirements and status updates.

c. Attends meetings for, and as directed by, the Project Logistics Manager.

1.4 Lead Mechanical Engineer

The Lead Mechanical Engineer shall provide mechanical and general engineering support to the Project Support Team as listed below. In addition, the Engineer works as a consultant directly with projects to identify areas where Code 270's project support capabilities would add value or reduce risk to the project.

a. Provides engineering consulting services and technical support to ILMD and project customers in defining and developing technical/logistics design criteria for Spacecraft/Science Instrument transportation requirements, and manages the overall transportation engineering support process (Section 3.1).

b. Coordinates and monitors all container modifications and isolation system design activities and provides engineering expertise to Code 279 packaging and handling activities.

c. Develops instrumentation specifications and criteria for monitoring the performance of the Transporter System. Researches and recommends equipment purchases to support unusual project requirements.

d. In conjunction with the Lead Packer and the Mechanical Engineer, analyzes the suitability of utilizing or refurbishing existing containers to meet project requirements at substantially reduced costs. Considers suitability of potential Transporter Systems for future GSFC missions and utilization.

e. Maintains an accountability of dedicated ILMD Transporter Systems (containers, environmental control system (ECS) units, and trailers) available for GSFC utilization. Also maintains an off-line spreadsheet showing availability and specifications of containers potentially available for use from other sources.

f. Prepares, reviews, and approves engineering, instrumentation, and project support documentation.

g. Provides Mechanical Engineering support to projects for off-site Principal Investigator (PI) Managed Missions, including the independent verification and validation of proposed Transporter Systems.

1.5 Mechanical/Packaging Engineer

The Mechanical/Packaging Engineer shall design and construct specialized containers to meet the specifications of project customers and shall manage the overall packing and crating support process (Section 3.7). The Mechanical/Packaging Engineer shall perform the following:

a. In conjunction with the Lead Mechanical Engineer, analyzes the suitability of utilizing or refurbishing existing containers to meet project requirements at substantially reduced costs. Considers suitability of potential Transporter Systems for future GSFC missions and utilization.

b. Coordinate all the Goddard Logistics Services Contract (GLSC) compliance activities required by Federal, State and Local government agencies, EPA, DOT, OSHA, NASA and the Goddard Space Flight Center. Ensures that all CFR 49 regulatory HAZMAT and CFR 29 HAZCOM compliance requirements are met or exceeded.

c. Conduct HAZMAT / Forklift Operators Safety Training as required (Basic and Recertification). Ensure that training records for logistics contractor personnel are accurate in the logistics contractors' training database and in personnel jackets as appropriate.

d. Support the Information and Logistics Management Division and space flight projects in operational matters as requested, conducts studies for Center and operational functions for safe and efficient packaging, handling and storage of space flight material.

e. Provides overall management of the instrumentation support process (See **Section 3.2**).

f. Coordinates Instrumentation Technician resource assignments and monitors technicians during instrumentation activities.

g. Manages the project logistics calibration process for instrumentation and weighing devices in accordance with Appendix C.

1.6 Instrumentation Technician

The Instrumentation Technician will receive supervisory and technical direction from the Mechanical/Packaging Engineer in supporting instrumentation activities. The Instrument Technician shall perform the following:

a. Performs instrumentation installation and removal, including recording system hardware and software setups and downloads.

b. Develops instrumentation documentation, as required.

1.7 Project Support Team

The Project Support Team consists of individuals in the Information and Logistics Management Division from specific functional areas who are assembled to support a specific project for the period of time that the project is active. Team members shall devote their time and effort as a significant additional duty to their regular work assignments such as the following:

a. Attends meetings scheduled by the Project Logistics Manager.

b. Provides responsive functional support to requirements documented by the Project Logistics Manager.

c. Keeps the Project Logistics Manager aware of significant direct communications between the team member and the project customer.

d. Informs both the Project Logistics Manager and the functional Supervisor/Branch Head when resource or priority conflicts arise (e.g., when supporting a single project customer will result in an inability to fully support another project or institutional logistics requirement).

1.8 Functional Branch Head

Code 270/279 Functional Branch Heads retain overall responsibility for the efficient and effective deployment of their personnel, material and financial resources. They shall be responsible for balancing levels of support dedicated for individual requirements, both project and institutional, and are responsible for leading the resolution of resource or priority conflicts in their functional area. In the project support context of this work instruction, they shall be responsible for:

a. Ensuring effective performance of personnel and equipment assigned to Project Support Teams.

b. Maintaining effective communications with the Project Logistics Branch Head regarding the general scope of project support activities in the Information and Logistics Management Division.

c. Maintaining effective communications with individual Project Logistics Managers regarding the effectiveness of support for individual projects.

d. Acting quickly to resolve identified resource, priority or technical approach conflicts, and elevating those issues that cannot be resolved in a win-win manner.

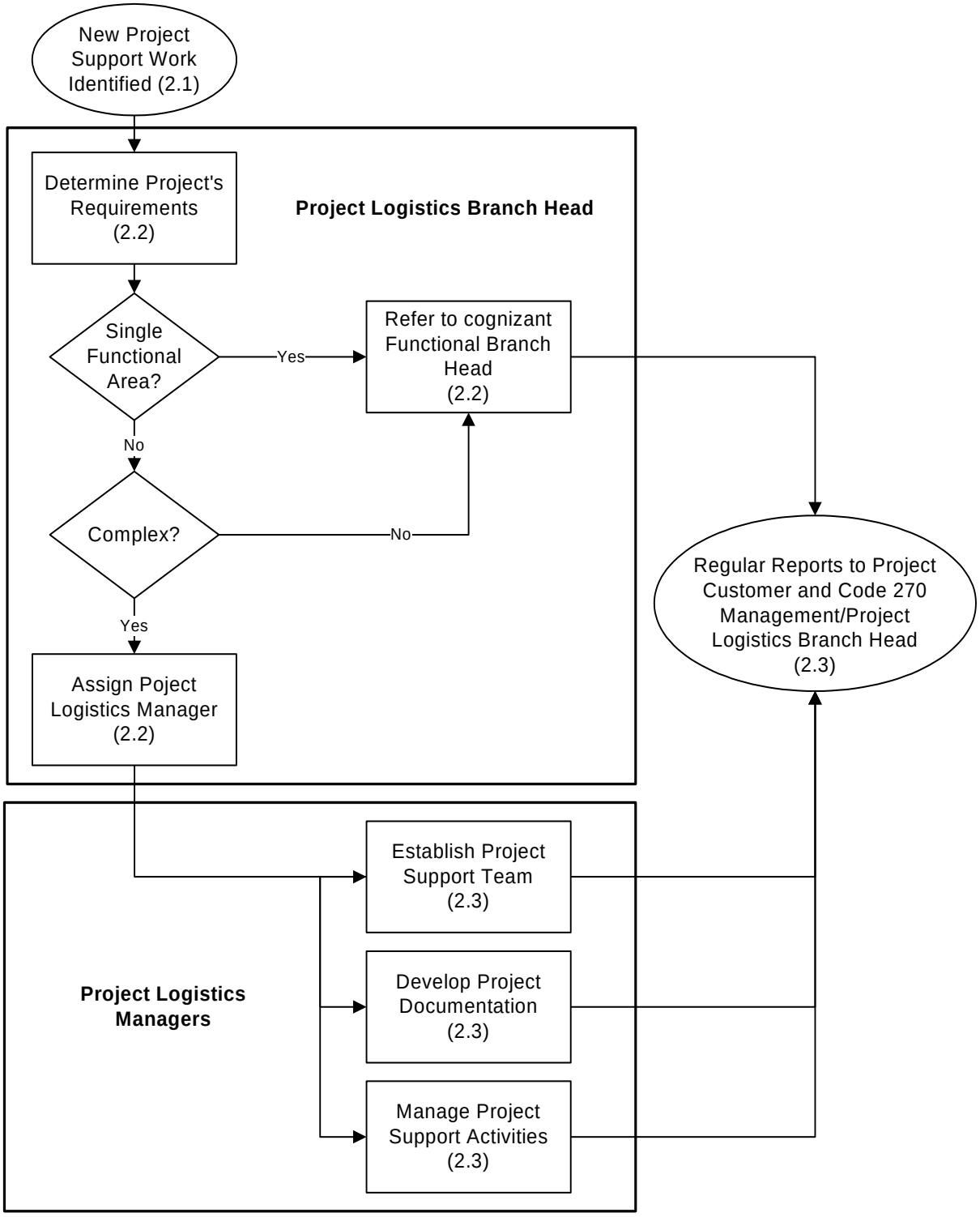
2.0 MANAGEMENT PROCESSES

2.1 Identification of Project Support Work

For all new projects in which there appears to be high potential for project support requirements involving multiple logistics disciplines, the Project Logistics Branch Head shall be apprised of the situation. As shown in Flowchart 2, information concerning these new projects/requirements should be

referred directly to the Project Logistics Branch Head from all sources, including Project Logistics Managers, Engineering, Traffic Operations Manager, Storage Manager, Supply Managers, Export Control, and other ILMD sources. For example, an information copy of GSFC Form 20-4's received from new projects will be forwarded to the Project Logistics Branch Head with a note indicating whether or not there may be potential for new logistics support involvement. In the case of project support work involving only a single functional area (e.g., procurement of space flight qualified parts for a single project customer), Functional Branch Heads shall keep the Project Logistics Branch Head apprised of the work through informal communications and, more formally, at regularly scheduled Project Support Meetings.

Flowchart 2: Assignment and Management of New Project Work



2.2 Assignment of Project Support Work

The Project Logistics Branch Head provides overall management of the assignment of project support work and ensures maintenance of the Project Support Matrix. Not every project requires the assignment of a Project Logistics Manager or Project Support Team, especially when the support requirements involve only a single functional area (e.g., traffic management, project parts or export control).

a. For projects potentially involving multiple logistics disciplines, the Project Logistics Branch Head may personally meet with project personnel and appropriate ILMD personnel to discuss the project's requirements. Attendees may include Project Logistics Managers and supporting members from the Project Support Team Matrix.

b. After an assessment of the project's requirements, the Project Logistics Branch Head shall determine what level of intra-ILMD coordination is required, and whether or not a specifically designated Project Logistics Manager should be assigned. In making this determination, consideration shall be given to the project's complexity and visibility, requirements for cross functional support within the ILMD, unusual technical requirements such as major moves, the project's in-house capabilities to provide their own logistics support, whether the project is a one-time operation or is ongoing, and other considerations.

c. Future logistics coordination with the project for the requirements identified will then be assigned to a Project Logistics Manager or will be performed on an additional-duty basis by an appropriate ILMD expert in the cognizant functional area.

d. For those projects supported directly by a functional area without the involvement of a Project Logistics Manager, if support requirements expand to include new requirements involving logistics disciplines outside of their functional area, Functional Branch Heads shall consult with the Project Logistics Branch Head to jointly determine as to whether a Project Logistics Manager needs to be assigned to coordinate overall support.

2.3 Logistics Coordination

The Project Logistics Manager provides overall management of the logistics coordination process for assigned projects and, when warranted, develops the Project Logistics Memorandum of Understanding (MOU) and maintains the Task/Action Item List for their projects. For those projects that do not have a Project Logistics Manager assigned, the cognizant functional area shall perform any needed logistics coordination.

a. Based on initial logistics support requirements developed with new project customers, the Project Logistics Manager will develop a matrixed Project Support Team consisting of individuals in the Information and Logistics Management Division from specific functional areas required by a specific project, and only for the period of time that the project is active. These functional areas are described in Sections 3.1 through 3.10 and are shown in the Code 270 Project Support Organization, Flowchart 1.

The assigned Project Logistics Manager will select individuals based on the Project Logistics Manager's (1) understanding of support requirements, as documented by the project customer, (2) knowledge of the skill mix of the Information and Logistics Management Division's workforce and (3) the availability of specific individuals to support a project, as determined by functional Supervisors and Branch Heads. The Project Logistics Branch Head shall review and ratify the selection of Project Support Team members with the advice and consent of Functional Branch Heads.

b. The Project Logistics Manager shall coordinate planning meetings with project personnel and Project Support Team members to identify and discuss project requirements, and ensures that appropriate functional areas are represented at these meetings. Since project requirements often change it is important that each functional area be cognizant of the project's general scope and requirements.

c. After the project's support requirements have been sufficiently identified, the Project Logistics Manager shall develop a Project Logistics MOU (Attachment 1), Logistics or Transportation Plan, and Logistics Task/Action Item List, if appropriate.

d. The Project Logistics Managers, Project Support Team members, and all functional areas shall work closely with the appropriate disciplines to provide support.

1. Transportation engineering support requirements shall be coordinated with the Mechanical Engineer and conducted in accordance with Section 3.1.
2. Instrumentation support requirements shall be coordinated with the Mechanical Engineer and conducted in accordance with Section 3.2.
3. Transportation support requirements shall be coordinated with the Transportation Officer/Traffic Operations Manager and conducted in accordance with Section 3.3.
4. Storage support requirements shall be coordinated with the Storage Manager and conducted in accordance with Section 3.4.
5. Procurement support requirements for projects services, material, and equipment will be coordinated with the Procurement Manager and conducted in accordance with Section 3.5.
6. Project parts support requirements will be coordinated with the Project Parts Section and conducted in accordance with Section 3.6.
7. Packing and crating support requirements shall be coordinated with the Mechanical/Packaging Engineer and conducted in accordance with Section 3.7.
8. Export control support requirements shall be coordinated with the Export Control Office and conducted in accordance with Section 3.8.
9. Hazardous materials support requirements shall be coordinated with the applicable functional area and conducted in accordance with Section 3.9.
10. Property accountability support requirements shall be coordinated with the Supply and Equipment Management Branch and conducted in accordance with Section 3.10.

e. The Project Logistics Manager shall work closely with the other functional areas to develop appropriate project management documentation (e.g., milestone charts, baseline schedules, task lists and assignments, resource utilization charts, and cost estimates). Scheduling software and other tools may be used for projects that have explicit support milestones and are led by a Project Logistics Manager. A sample is provided in Attachment 2.

f. In the event that the Project Support Team develops conflicting support approaches, the Project Logistics Manager shall make every effort to achieve a workable (to the project customer) resolution of these alternatives. This shall be achieved through explicit and open discussion of these issues with and between all concerned members of the Project Support Team as well as the project customer's organization. In the event that the Project Support Team is unable to reach a technical consensus, the matter shall be referred to the Project Logistics Branch Head for further discussion and development of a consolidated Code 270 recommendation to the project. Any un-recommended technical approaches that could be of interest or value to the project customer shall be presented and the reason for their discounting given.

g. The Project Logistics Manager will identify logistics documentation required by the project and will coordinate development of Logistics Plans, Transportation Plans, and Transportation Reports.

h. The Project Logistics Manager shall determine when Trip Reports are required and shall ensure that Trip Reports are completed and appropriately distributed. If the Project Logistics Manager does not attend the meeting, he/she shall designate an attendee to prepare and distribute the Trip Report.

i. Project Logistics Managers and the other functional disciplines shall keep the Project Logistics Branch Head and ILMD Division Chief/Program Manager apprised of their performance in support of their assigned projects. This will be accomplished through informal meetings, attendance at Project Support Meetings, updates of the Project Support Matrix, and other appropriate methods (e.g., distribution of meeting minutes).

2.4 Risk Management

The practice of risk identification, assessment, mitigation and elimination shall be embedded in all project support activities. Risk categories are Cost, Schedule, Scope and Performance. All project support reporting, such as Project Support Meetings, formal and informal communications with project customers, plans, and MOU's shall address the risk as described below. The preferred response to project support risk is to eliminate or mitigate the conditions that lead to that risk through revision of project support processes or the commitment of sufficient Code 270 resources to overcome the risk. When that is not possible, every possible step shall be taken to:

1. Clearly and quickly communicate the nature of the risk to Code 270 Management and the project customer along with best, worst and likely outcomes; and

2. Recommend steps to mitigate impacts to Cost, Schedule, Scope and Performance.

The first step in risk management is to clearly identify the type, source/trigger and severity of risk at issue. All project readiness and status reporting will contain an explicit risk-reporting element following the guidelines below.

a. **Risk Type.** All risks shall be classified into one (or more) of four categories depending on the ability to meet requirements that is impacted. Normally cost, schedule, scope and technical performance requirements will be specified in a Memorandum of Agreement with the project customer.

Cost – ability to provide necessary support at the cost negotiated with the project customer
Schedule – ability to meet support milestones negotiated with the project customer
Scope – ability to perform required support within the functional support areas negotiated with the project customer
Performance – ability to meet technical performance requirements specified by the customer, this includes safety requirements

b. **Risk Triggers.** Initial awareness of risk factors will be "triggered" by information that signals the potential for obstacles to agreed-upon cost, schedule, scope or technical performance requirements. It is essential that all Code 270 employees involved in project support activities be aware of these triggers and communicates their assessment of possible impact to the Project Logistics Manager as soon as they are known. These triggers are:

TH: HAZMAT – unusual hazardous material requirement, especially when coupled with TX
TX: Export/Import – especially if International Traffic in Arms Regulations (ITAR) issues are involved
TO: Oversize – could limit selection of shipping modes or routes
TV: High Value – unusual liability or irreplaceable /one-of-a-kind
TR: High Resource Use – especially if there will be an impact on Code 270's ability to support other mission areas
TNEW: Initial Inquiry – new work could require that Code 270 develop new resources or processes
TI: High Interest/Visibility – any activity that could have increased management awareness due to factors not identified in the other risk triggers (e.g., activity is included in GSFC Strategic Plan, political factors are important, or customer has alternative sources for support)

c. **Risk Severity.** An assessment of the likely operational impact of the trigger or the existence of particular circumstances shall result in the severity of a risk identified being expressed as High, Medium, or Low. The following guidelines are provided.

High/Red –

- A delay that jeopardizes mission success
- Cost increase of 20 percent or more or efforts that require de-scoping or other significant cost-control measures
- Significant personnel changes or reductions that threaten continuity

- The requirement is beyond ILMD's present expertise or resources, and no ILMD out-of-house alternatives exist
- Performance issues have occurred and resulted in significant customer dissatisfaction and they have a mission impact
- A non-compliance with law or regulations exists
- Insufficient time exists and emergency efforts are required to process a shipment, especially when import/export shipments or hazardous materials are involved

Medium/Yellow –

- A delay results in inconvenience, but mission objectives can be met
- Cost increase of 10 percent or more but less than 20 percent
- Personnel changes or reductions could result in temporary loss of capability
- The requirement is beyond ILMD's present expertise or resources, but in our out-of-house alternatives
- Performance issues have occurred and resulted in moderate customer dissatisfaction with no major impact other than inconvenience
- Adverse publicity exists from special interest groups
- Performance requirement only to be met through re-evaluating ILMD's priorities, adding resources, or adding new capabilities/equipment
- Customers have been dissatisfied with support in the past
- Shipment is over 15 feet in height
- Shipment involves the use of a crane

Low/Green –

- No expected delays or no adverse consequences if a minor delay occurs
- Cost increase of less than 10 percent of negotiated target
- Stable support personnel team in place or personnel changes that have negligible impact
- Requirement is within ILMD's areas of expertise and we are prepared to perform the activity
- Customers are enthusiastic about our involvement
- No regulatory or political issues exist

Project Logistics Managers shall ensure that risk management is addressed in all project support plans (e.g., Transportation and Instrumentation Plans), meeting minutes, Logistics Task/Action Item Lists and in the Project Support Matrix that forms the basis for the updates at the Project Support Meeting. That is, Cost, Schedule, Scope, and Performance risks shall be identified and assessed as to their severity. Risk mitigation or elimination recommendations shall be discussed with project customers, and results of these discussions captured in either revised plans or meeting minutes.

2.5 Resolution of Resource and Operational Issues

Occasionally, situations arise where a Project Logistics Manager cannot meet a project customer's requirements being met because of insufficient resources available or higher priority work assigned to members of the designated Project Support Team. There are two guiding principles in this resolution process, (a) that all efforts at resolution be exhausted before escalating to the next level and (b) that, ultimately, the Project Logistics Manager shall be responsible for coordinating any operational changes needed to effect resolution.

The Project Logistics Manager shall coordinate an effort to re-direct Code 270/279 resources and to attempt to renegotiate requirements (e.g., extend deadlines or provide alternatives) with the affected project customer. The resource/priority resolution process includes subsequent escalation through the Project Support Team, the project customer, Code 270/279 Functional Branch Heads, the Project Logistics Branch Head and, in extreme cases, the Code 270 Division Chief.

a. Initially, the Project Logistics Manager will meet with the designated Project Support Team to analyze the priority/resource conflict and attempt to develop a resolution using the resources available to the Team. Normally, this will consist of developing alternative technical approaches and making a recommendation. In the event that the Project Logistics Manager and the Project Support Team cannot determine which alternative to recommend, the Project Logistics Branch Head shall make the decision.

b. The next step involves a re-negotiation of project requirements with the project customer. The Project Logistics Manager and the project customer shall examine operational deadlines, quantity or quality requirements, and other information to determine if there is any flexibility in project requirements that could eliminate the resource/priority conflict. In addition, the recommended alternative approach, as well as those technical approaches that were considered but not recommended, shall be presented to the project customer for approval.

c. If the first two steps are unsuccessful, the Project Logistics Manager, and, if necessary, the Project Logistics Branch Head, shall meet with appropriate Code 270/279 Functional Branch Heads to determine if additional resources could be added to the Project Support Team or if other functional commitments could be realigned to allow a higher priority to be given to the project support effort. This shall require a broad consideration of all ILMD priorities and commitments.

d. In the event that the above steps do not result in a satisfactory resolution for the project customer, the Project Logistics Branch Head shall refer the matter to the Code 270 Division Chief who shall consider how this work fits into the Division's overall commitments and priorities, and may also discuss the matter with the overall technical Project Manager. Depending on the nature of the resolution, the Code 270 Division Chief may direct changes to existing Work Instructions or assign a specific action to be tracked. The Information and Logistics Management Division is committed to working at all levels to create an acceptable and professional resolution to all issues.

2.6 Financial Management

Projects may fund their support by the ILMD through (a) direct reimbursement, (b) claiming support through ILMD's project "service pool," or (c) funding individual positions in specific functional sections of the ILMD. Functional managers are responsible for ensuring that qualified individuals are assigned to project support work, and that they appropriately charge their support activities. The Project Logistics Manager for a specific project shall (a) be aware of the mix of people and funding working in support of their project customers, (b) be alert to impending changes in the volume and nature of project support work, and (c) work closely with Code 270 financial management specialists to educate project customers of their role in ensuring expeditious and appropriate flow of funding.

a. Reimbursable funding by projects for specific purchases or one-time logistics services (e.g., travel or equipment refurbishment) is normally through a project financial accounting string or purchase request. When a financial accounting string or purchase request is required to initiate a Code 270 support action, the Project Logistics Manager shall work with the Code 279 Administrative Coordinator to develop an estimate that the Administrative Coordinator shall forward directly to the Code 270 and project Resources Analysts. When the financial accounting string/purchase request is in place, the Project Logistics Manager shall inform all concerned in the Information and Logistics Management Division of its identity, limits and availability. The Project Logistics Manager shall keep informed concerning charges made against the project's financial accounting string/purchase requests and work with cognizant project and/or ILMD personnel when a significant departure from the estimate is expected.

b. In addition to direct reimbursements, the ILMD also supports projects out of the annually budgeted "service pool." Project Logistics Managers shall be aware of the direct project charge numbers that apply to projects that they are coordinating, and communicate the proper charge numbers to Project Support Team members working on those projects.

2.7 Coordination of Project Travel

Project reimbursement, normally by a purchase request, is required in order for Information and Logistics Management Division personnel to travel in support of projects. Because of the expense and potential operational impact of ILMD personnel being physically absent, extra care is given to (a) establish an explicit project requirement and (b) coordinate the absence of ILMD personnel with their functional Supervisor and Branch Head. It is important that travel arrangements be made as far in advance as possible in order to take advantage of discounted airfares.

a. At the earliest possible date, the Project Logistics Manager shall discuss the general travel requirement and dates with the project customer, and suggest cost saving alternatives/options. This includes advance reservations and minimum Project Support Team members consistent with meeting project requirements. At the same time, the project shall be informed of the need to generate a purchase request to fund the travel.

b. As soon as travel requirements are known, the Project Logistics Manager shall inform Functional Branch Heads and Supervisors, as well as members of the Project Support Team, to ensure the time availability of designated personnel to participate.

c. The Project Logistics Manager shall collaborate with the project customer to obtain written, detailed documentation from Government project management personnel describing the specific logistics requirements, dates, named individuals (if any) or any other special considerations. This documentation, along with any necessary explanatory remarks, shall be forwarded to Code 270/279 administrative support personnel to prepare travel orders and make coordinated travel arrangements. This documentation shall be attached to travel approval forms routed for signature.

d. Wherever possible, the Project Logistics Manager will coordinate travel arrangements to: (1) maintain the cohesion and effectiveness of those traveling, (2) minimize cost, and (3) minimize the amount of time spent on travel.

e. The Project Logistics Manager shall designate a Team Leader for the travel party who shall: (1) serve as the principal point of contact between the on-site project manager and the travel party, (2) communicate regularly with the Project Logistics Manager and/or Project Logistics Branch Head, and (3) recommend changes in travel schedules or levels of on-site support.

f. The Project Logistics Manager shall determine whether a Trip Report is required. If a Trip Report is required, the Travel Team Leader shall prepare a consolidated Trip Report no later than three workdays after the completion of travel and shall ensure that it is appropriately distributed.

2.8 Documentation Management and Control

Maintaining complete, accurate and up-to-date Code 270 project support documentation is a baseline requirement. The Project Logistics Branch Head shall be responsible for maintaining this work instruction and individual Project Logistics Managers shall be responsible for maintaining the control and accuracy of operational project support documents.

a. Documentation Development, Review, and Approval - The operational project support documents for each individual project shall be developed, reviewed, approved and maintained in a separate Project Folder as follows:

1. Project Logistics MOU – The Project Logistics Manager coordinates development and review. The Project Logistics Branch Head and the project approve the document. A copy of each MOU and subsequent modifications shall be forwarded to the Project Logistics Branch Head.

2. Transportation Plans, and Transportation Reports – The Project Logistics Manager coordinates development and review. The Project Logistics Branch Head and the project approve the documents.

3. RFP's/SOW's – The Project Logistics Manager coordinates development and review. The Project Logistics Manager/Procurement Manager and the project approve the documents.

4. Supply Support Plans – The Project Logistics Manager/Supply Manager coordinates development and review. The Project Logistics Manager/Supply Manager and the project approve the documents.

5. Trip Reports – The Project Logistics Manager (or designee) coordinates development and review of these documents. No approval is required.

6. Drawings – The Project Logistics Manager coordinates development and review of flight hardware drawings prepared by outside agencies or contractors. Drawings for transportation support hardware (e.g., container and trailer modifications) will be prepared by the Mechanical Engineer. The Mechanical Engineer shall approve these documents.

7. Project Support Matrix – The Project Logistics Branch Head coordinates development and review. Each Project Logistics Manager and the other functional disciplines will maintain their portion of the document. No approval is required.

8. Transporter Systems Equipment Matrix – The Mechanical Engineer develops and maintains this document. No approval is required.

9. Task/Action Item List – Each Project Logistics Manager develops and maintains this document for their assigned projects, if appropriate. No approval is required.

10. Other Documentation – The Project Logistics Manager coordinates the development and review of other documentation (e.g., operations and maintenance manuals).

11. External Documents – The Project Logistics Manager coordinates internal review of logistics documentation prepared by outside agencies or contractors (e.g., Responses to RFPs/SOWs, Logistics Support Plans, and Interface Control Documents).

b. Documentation Storage and Control - When practicable, project-specific working documents, including draft versions under development, shall be stored electronically in the Project Logistics Electronic Library to which all appropriate personnel in Code 270 shall have, at a minimum, read permission. Each document shall be clearly marked with its title, author, effective date and an indication if it is a draft version.

3.0 SUPPORT PROCESSES

3.1 Transportation Engineering Support

The purpose of transportation engineering is to assist in selecting the optimum transportation approach to satisfy requirements, consistent with project goals, scheduling and milestones, spacecraft/instrument

safety, and cost-effectiveness. This is accomplished through an analysis of Transporter System requirements and subsequent design, fabrication/modification, and testing of such systems.

The Lead Mechanical Engineer shall provide overall management of the transportation engineering process; coordinates the scheduling of containers for use by projects; and shall develop and maintain the Transporter Systems Equipment Matrix.

a. The Lead Mechanical Engineer shall participate in meetings and discussions with project personnel to ensure that projects are fully briefed on Code 270's engineering capabilities and services, and to identify and scope initial engineering requirements.

b. An analysis of spacecraft/instrument design criteria shall be completed to ascertain design requirements for new and modified Transporter Systems, typically including a container, ECS unit, and trailer/air ride van, for transport of Flight Project Spacecraft and Science Instruments.

c. The Lead Mechanical Engineer shall provide engineering consulting services to the Project Support Team and projects for container design/modification, the design and/or review of Spacecraft/Container Load Isolation Systems, mounting fixtures, and overall Transporter System integration to mitigate the effects of shock and vibration during transport. This includes critical timeframes that must be incorporated into Transporter refurbishment and operational testing. Reviews of the transportation analysis shall also be conducted to ensure any hazardous material limitations are considered in the engineering design/development of a specified Transporter System.

d. When it is determined that a Transporter System must be designed, fabricated, or modified, the Lead Mechanical Engineer shall provide engineering expertise for development of RFP/SOW Transportation-related engineering specifications, terms, and conditions. The Lead Mechanical Engineer shall also participate in reviews and provide input concerning contractor submitted proposals, specifically focusing on the proposed transportation approach and the resulting engineering/cost impacts and technical feasibilities. The Lead Mechanical Engineer shall monitor the fabrication or modification of containers performed by contractors. Schedule and cost estimates and resource requirements shall be provided to the Project Logistics Manager. Results from the transportation engineering process will be used to support development of Logistics Plans, Transportation Plans, and other project support documentation.

3.2 Instrumentation Support

The purpose of instrumentation is to document the shock and vibration environment experienced by the space flight hardware during transportation. In the event of subsequent anomalies, this data will assist in determining whether the damage occurred during transport.

The Mechanic Engineer shall provide overall management of the instrumentation process. This process applies to instrumentation performed on spacecraft or science instrument transports and during verification and validation of the Transporter System (also known as a road test).

a. The Mechanical Engineer shall work with the Project to determine instrumentation requirements.

b. All instrumentation operations shall be documented (e.g., Instrumentation Plan or Instrumentation Analysis Report. The Mechanical Engineer shall determine which documents are appropriate.

c. Schedule and cost estimates and resource requirements shall be provided to the Project Logistics Manager. Results from the instrumentation process shall be used to support development of Logistics Plans, Transportation Plans, and other project support documentation.

d. The Mechanical/Packaging Engineer shall maintain all instrumentation hardware and software. This includes: the installation and configuration of software on notebook and desktop computers; coordination with hardware/software suppliers for upgrades and in troubleshooting problems; and the calibration and repair of equipment.

Instrumentation support shall be provided by contacting the Mechanical Engineer. Instrumentation customer support operations are conducted in accordance with 270-WI-6400.1.1.

3.3 Transportation Support

The Transportation Officer/Traffic Manager shall plan, direct, and coordinate transportation and special handling support for critical transportation needs of sensitive space flight hardware and ground support equipment and shall be responsible for services for domestic and international shipments, as well as support for specialized or unusual requirements.

a. Shipment planning (including analysis of route, mode, and method) and carrier selection.

b. Performance of road tests and coordination of Special Assignment Airlift Missions.

c. Coordination of special lift and handling requirements with individual projects to ensure required training and certification of personnel and equipment is current (e.g., rigging services for large or over-dimensional items).

d. Shipment tracking (routing, tracing, and monitoring) and follow-up on any shipping performance issues.

To obtain services, bring the item to the Packing and Crating Shop. All items must be accompanied by a signed GSFC Form 20-4 (/Shipping/Transfer Request). Arrangements will also be made for the items to be picked up from the customer's location. Requests should be made 5 workdays prior to the shipping date. Transportation support operations are conducted in accordance with 270-WI-6400.1.2.

3.4 Storage Support

The Storage Manager shall provide overall management of the GSFC Storage Program that provides short-term or long-term leased storage for equipment and materials, including space flight hardware and ground support equipment. Customer storage listings, specialized reports, ad hoc queries and assistance

in preparing storage documents are available upon request from the Storage Manager. Features of the program include the following:

a. Leased warehouse space has heating, air conditioning, and accommodations for large or oversized items. Each fiscal year bills are sent to owning directorates to pay for storage at the leased facilities. Customers also pay for costs incurred for special transportation requirements, e.g., rigging. Customers shall be billed a prorated charge for the items stored after the normal billing cycle.

b. Storage facilities are local to GSFC (Laurel, Maryland); however leases may be established at other locations upon request.

c. Items are properly monitored for condition and deterioration during storage to ensure that they are stored in accordance with customer requirements.

d. Equipment pooling of specialized equipment is available to reduce costs. The Storage Manager will try to make arrangements with the owner of the equipment to loan it out for a specific time period.

Via the Storage Information Management Syetm (SIMS), customers complete a Storage Request to place items into storage and a Storage Out Request to take items out. Storage support operations are conducted in accordance with 270-WI-6400.1.3.

3.5 Procurement Support

The Procurement Manager shall provide support for procurement of services, materiel, and equipment to meet the technical and complex engineering and scientific requirements of projects and other program activities. Emergency requisition support and tracking capabilities are available (e.g., vendor follow-up, expediting support, and status reporting).

a. Support for specialized items (e.g., compressed or bulk gases, custom-built items and fabrication support, and project parts)

b. Development of procurement packages, validation of technical requirements with requisitions originators, and development and submission of special technical justifications.

c. Research of item availability, to include: research and cataloging services, locating qualified vendors, and meeting required delivery dates.

Support for procurement activities shall be provided by contacting the Procurement Manager (see Section 3.6 for projects parts procurement support). Procurement support operations are conducted in accordance with 270-WI-5100.1.1.

3.6 Project Parts Support

The Project Parts Section shall provide complete acquisition support (purchasing, storage, issue, delivery) for flight qualified project parts during all phases (brassboard, engineering, or flight models) of development and construction of in-house GSFC instruments and satellites. Specialized support for inspection and testing, kitting, and emergency requisitions is available. Features of the program shall include the following:

a. Purchases are from NASA approved manufacturers and vendors, and certification/traceability documentation and test reports are available.

b. Electrical, Electronic and Electromechanical (EEE) parts are stored in an Electrostatic Sensitive Discharge (ESD) Certified Parts Facility with temperature and humidity controls.

c. A flight fastener inventory (both metric and U.S. standard) has been established to reduce costs and procurement lead-time by buying fasteners in bulk and distributing them from a central inventory. The Code 270 Fastener Website is located at http://logistics.gsfc.nasa.gov.

d. The residual parts inventory includes electrical and mechanical parts which are available free of charge with the exception of shipping charges.

To place an order for project parts (EEE parts, fasteners, and residual parts) a customer account must be established in the Advanced Materials Management System. An on-line catalog of parts in stock may be viewed at http://logistics.gsfc.nasa.gov . Project parts support operations are conducted in accordance with 270-WI-4520.2.1, 270-WI-5100.1.1, 270-WI-5310.4.1, 270-WI-5330.3.1, 270-WI-5340.2.1, 270-WI-6400.1.4 and 270-WI-6400.1.5.

3.7 Packing and Crating Support

The Mechanical/Packaging Engineer shall provide overall management of packing and crating support for the protection of highly sophisticated and fragile spacecraft and instruments. Appropriate packaging shall be used to protect against adverse climatic and environmental conditions, stacking weights, and to meet mode of shipment and long-term storage requirements.

a. Design and fabrication of custom containers (e.g., crates, boxes, cartons, and other containers).

b. Classification and packaging of hazardous materials and material sensitive to electrostatic discharge.

c. Adherence to marking, stenciling, and labeling requirements.

To obtain services, the item should be brought to the Packing and Crating Shop. All items must be accompanied by a signed GSFC Form 20-4 (Shipping/Transfer Request). Arrangements could also be made for the items to be picked up from the customer's location. Packing and crating support operations are conducted in accordance with 270-WI-6400.1.1.

3.8 Export Control Support

The Export Control Office shall provide information and controls necessary to properly export hardware, technical data (including publications, presentations, and websites) and technology (including software) to/from international locations. Assistance is also provided in the processing of foreign visitor requests. The Export Control Office Website is located at http://export.gsfc.nasa.gov. Export control support includes, but is not limited to, the following:

a. Identification of appropriate justification and authority for exports/imports, and interpretation of export and import laws/regulations.

b. Preparation of contract clauses and identification of appropriate export and import terms and conditions.

c. Obtainment of appropriate licenses and approvals. Development and approval of license applications usually take six months to complete.

d. Assistance in the clearing of equipment and materials through foreign country customs, and foreign shipments through U.S. Customs.

e. Reviews of documents for export control compliance.

f. Reviews of visit requests involving foreign nationals.

Export control support is conducted in accordance with 270-WI-6400.1.6.

3.9 Hazardous Materials Support

Each functional area (e.g., transportation and packing/crating) shall be responsible for ensuring that their support processes involving hazardous materials are conducted in compliance with all Federal and state hazardous materials (HAZMAT) regulations and practices. For transportation requirements, the Transportation Officer shall obtain the necessary Federal and state exemptions and permits while Code 279 shall provide classification, certification and packaging services for HAZMAT items. Examples of HAZMAT include the following: heat pipes, explosive separators, batteries, solvents and other cleaning supplies, and paint.

Code 270 must be informed as soon as possible by the project of any support requirements involving HAZMAT. This information sometimes is available in project documentation such as Project Safety Plans or Launch Site Support Plans. Whenever Code 270 personnel become aware of any unusual hazardous materials requirements, they shall inform the appropriate Functional Branch Manager.

All hazardous materials shipments must be processed through the Packing and Crating (P&C) Shop. The customer shall deliver the HAZMAT item to P&C with a completed GSFC Form 20-4

(Shipping/Transfer Request) and a Material Safety Data Sheet (MSDS) for each HAZMAT item. Hazardous materials support operations are conducted in accordance with 279-PLAN-1700.1.2.

3.10 Property Accountability Support

The Supply and Equipment Management Branch shall provide overall management of the property accountability process. This includes Tagging-In-Division (TID) of equipment that is not received through Central Receiving, providing equipment management reports and printouts to assist in maintaining equipment accountability, and conducting periodic inventories of controlled equipment.

All equipment, including space flight hardware and ground support equipment, that is valued at $5,000 or more, or designated as a "sensitive item" by GSFC's Supply and Equipment Management Officer (SEMO), must be placed under property accountability and have an Equipment Control Number (ECN) barcode tag affixed to it. If items are located which meet the above criteria and they do not have a barcode tag, the Property Custodians of the owning organizations will be contacted so that they are able to arrange to have the item placed under proper accountability. Property accountability support operations are conducted in accordance with 270-WI-4200.0.1 the Equipment Management work instruction.

4.0 NONCONFORMANCE MANAGEMENT

4.1 Nonconformances

The overall Nonconformance Lead (NCL) for the activities in this work instruction is the Code 274 Logistics and Transportation Management Branch Head. The NCL serves as the principal point of contact within ILMD responsible for the management and proper functioning of the nonconformance process in that functional area, provides technical oversight and identifies nonconformance trends that may require changes to existing policies or procedures, and reports significant issues to higher management. The NCL is also responsible for reviewing and processing Problem Reports (PR's) and Nonconformance Reports (NCR's) received from any source as well as directing and documenting corrective actions taken in response to PR's and NCR's. The primary documentation for these activities shall be created in the automated Problem Reporting/Problem Failure Reporting (PR/PFR) system or the Nonconformance Reporting/Corrective Action (NCR/CA) System, which are accessed via the GSFC MS website.

4.2 Minor Nonconformances

As determined by the appropriate Code 270/279 Functional Branch Head, some nonconformances will be managed outside of the PR/PFR and NCR/CA systems. There is no single method for documenting and dispositioning these minor nonconformances. All minor nonconformances shall be recorded in an approved record, and, the cognizant supervisor shall review the documentation and determine the most appropriate disposition. In those instances when a close out action is necessary, it will also be annotated on an approved record.

4.3 Nonconformance Initiation and Disposition

After the NCL reviews a PR or NCR, the NCL shall request and/or develop disposition recommendations. For most nonconformances, this will be an internal process. In the case of services provided directly under the direction of operational Projects, the appropriate Project personnel shall be consulted. In some cases, the Project may assume control of the PR or NCR process. In those cases, the NCL will update the PR or NCR to show this transition. In all other cases, the NCL shall lead the PR or NCR disposition process.

Once the review is complete, the NCL shall input the disposition into the PR/PFR or NCR/CA system. In cases where policy may be affected, the ILMD management shall be consulted prior to completing the disposition process. If no corrective actions are required, the NCL shall close out the PR or NCR.

4.4 Corrective Actions

If resolution of the PR or NCR involves initiation of corrective action, the NCL shall continue to update the PR or NCR with root causes, actions taken and remedial actions if and when they are part of the corrective action process. Upon completion of all corrective actions, the NCL shall close out the PR or NCR. In some cases corrective actions will point to other nonconformance issues that need to be resolved. If this happens, the NCL shall create a follow-on PR or NCR, and the process will begin again.

Appendix A – Definitions

a. Instrumentation Analysis Report – Comprehensive report documenting the results of an instrumentation activity. Report contains all instrumentation data analyses and recommendations, describes Code 270's involvement, and includes any after action reports and lessons learned.

b. Instrumentation Checklist – Specific procedures for installing and activating instrumentation equipment for a specific instrumentation operation.

c. Instrumentation Plan – Overall plan for conducting instrumentation activities for a project. Describes organization, roles and responsibilities, activities to be completed, and processes to be followed for providing support.

d. Instrumentation Matrix - A consolidated document that identifies Code 270's "data-loggers" that record shock events, and/or temperature and relative humidity readings. The document identifies the individual devices by: NASA Equipment Control Number (ECN), serial #, description, calibration due date, corner frequency (hz), memory capacity, comments, unit cost, and battery last checked date.

e. Instrumentation Report – "Quick-Look" report documenting basic instrumentation results.

f. Logistics Plan – Overall plan for conducting logistics support for a project. The plan describes organization, roles and responsibilities, activities to be completed, and processes to be followed for providing support.

g. Major Move – Shipment of critical flight hardware and related equipment (e.g., spacecraft or flight instrument).

h. Principal Calibration Laboratory – A specialized laboratory that is staffed and equipped to perform calibrations, inspections and repair of IMTE. The term Principal Calibration Laboratory used in this document refers to the Center's calibration laboratory, managed by Code 540 at Goddard's Greenbelt Facility.

i. Project Memorandum of Understanding – Agreement between Code 270 and a project on the overall roles and responsibilities of each party for the management and coordination of logistics support.

j. Project Support Matrix – A consolidated document that identifies Code 270's logistics support roles for projects supported; identifies risk type, triggers, and severity; and provides a summary description of the status of that support.

k. Project Support Meeting – Regularly scheduled meetings conducted by the Project Logistics Branch Head to brief ILMD management on the status and activities of Code 270's support to the project community. Meetings will include attendance by Project Logistics Managers and other project support personnel (e.g., Traffic Operations Managers and Supply Managers) who will brief their areas of responsibility.

l. Scales Matrix - A consolidated document that identifies Code 270's weighing equipment (scales); identifies model, interval, department, manufacturer, asset #, description, calibration due date, last calibration date, user name/contact #, building/room location, instrument type, location, and end user.

m. Task/Action Item List – Project-specific listing of tasks and action items to be performed by Code 270 in support of a project. The list may contain descriptions of tasks/action items, responsibilities, due dates, and other information.

n. Transportation Analysis – Analysis of alternatives for moving flight hardware, including cost estimates and transportation mode selections (e.g., air versus surface).

o. Transportation Plan – Overall plan for conducting transportation support for a project. The plan describes organization, roles and responsibilities, activities to be completed, and processes to be followed for providing support.

p. Transportation Report – Report documenting the results of a transportation activity. Describes Code 270's involvement, and includes any after action reports and lessons learned.

q. Transporter System – Equipment (e.g., shipping container, environmental control system, trailer, and tractor) needed to ship a spacecraft or flight instrument.

r. Trip Report – Describes what transpired at meetings/activities attended by Code 270 personnel, including any actions assigned to Code 270.

Appendix B – Acronyms

ANSI/NCSL	American National Standards Institute/ National Conference of Standards Laboratories
CBU	Calibrate Before Use
ECN	Equipment Control Number
ECS	Environmental control system
EEE	Electrical, Electronic and Electromechanical
ESD	Electrostatic Sensitive Discharge
GDMS	Goddard Directives Management System
GSFC	Goddard Space Flight Center
HAZMAT	Hazardous materials
ILMD	Information and Logistics Management Division
IMTE	Inspection, Measuring and Test Equipment
ITAR	International Traffic in Arms Regulations
MOU	Memorandum of Understanding
MS	Management System
NCL	Nonconformance Lead
NCR	Nonconformance Reports
NCR/CA	Nonconformance Reporting/Corrective Action
NPD	NASA Policy Directive
PI	Principal Investigator
PR	Problem Reports
PR/PFR	Problem Reporting/Problem Failure Reporting
RFP	Request for Proposal
SEMO	Supply and Equipment Management Officer
SOW	Statement of Work
TID	Tagging-In-Division

Appendix C – Calibration Process

This appendix establishes the process for ensuring that Inspection, Measuring and Test Equipment (IMTE) used in the Code 274/279 project logistics operations are properly calibrated, maintained, and identified. The calibration requirements of this program are two-fold; they consist of the calibration of:

1. Instrumentation devices (sensors) for shock, vibration, temperature and relative humidity monitoring
2. Weighing devices (scales); both electronic and mechanical

The Mechanical/Packaging Engineer manages this process for instrumentation and weighing devices in accordance with NPD 8730.1, GPR 8730.1 and through interaction with the Code 540 Principal Calibration Laboratory and recertification vendors.

The periodic calibrations of both the instrumentation and weighing devices will be conducted using the Code 540 calibration lab and will be in conformance with the manufacturers' recommended intervals. Additionally, all procurements related to new equipment purchases, repairs or calibrations of existing devices will be to vendors that meet the calibration standards established in GPR 8730.1.

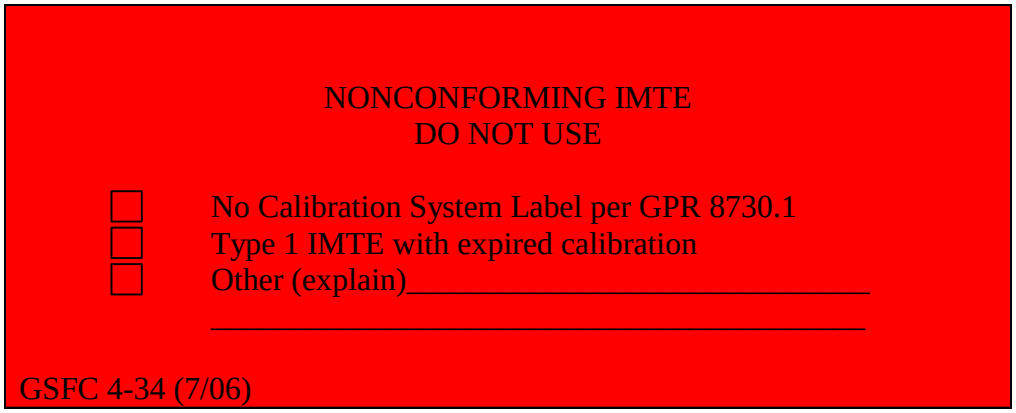
All weighing devices will be maintained in a Type 1, Calibration Required status. The instrumentation devices and related equipment are maintained in the majority as Type 2, Calibrate Before Use, with a small minority of items maintained as Type 1, Calibration Required status or Type 3, Calibration Not Required status. All IMTE are labeled with the applicable status.

To assist in managing the IMTE, the Mechanical/Packaging Engineer maintains two listings of IMTE with their descriptions, calibration status and related information.

1. An electronic inventory of instrumentation devices and related equipment (Instrumentation Matrix). This information is used to provide changes and updates to the Code 540 Calibration Laboratory.

2. An electronic inventory of weighing devices (scales); both electronic and mechanical (Scales Matrix). This information is used to provide changes and updates to the Code 540 Calibration Laboratory.

The calibration records for the IMTE are maintained by the Code 540 Calibration Laboratory. All items that are out of calibration or are nonconforming will be affixed with a GSFC 4-34, Nonconforming Tag to preclude unintended usage and will be segregated from IMTE that is properly calibrated and in working condition.



Nonconforming IMTE Tag

Attachment 1

Project Logistics Memorandum of Understanding (*Sample*)

MEMORANDUM OF UNDERSTANDING
FOR TBD LOGISTICS SUPPORT
BETWEEN THE TBD PROJECT/CODE XXX
AND THE
INFORMATION AND LOGISTICS MANAGEMENT DIVISION/CODE 270

Month/Day/Year

TBD	Marilyn C. Tolliver
TBD Mission Manager	Chief, Information and Logistics Management Division

PURPOSE

The purpose of this memorandum of understanding (MOU) is to define the leadership roles and responsibilities of the **TBD** Project (Code **XXX**) and the Information and Logistics Management Division (Code 270) for the management and coordination of the TBD logistics effort. This effort includes the planning and execution of the transportation of the **TBD spacecraft**. The attached task list delineates specific lead responsibilities of Code **XXX** and Code 270. The task list shall serve as the planning tool for Codes **XXX** and 270 and shall be updated until the Transportation Plan is approved. Upon approval, the Transportation Plan shall become the master document.

GENERAL

Code 270 shall provide logistics support including supply support, storage, transportation support, transportation analysis, shock and vibration instrumentation and analysis, and engineering consulting services. Code 270 shall coordinate and accompany the **TBD** container on all road tests and Spacecraft transports. Code 270 shall, upon request of TBD Project, provide engineering consulting services, including, but not limited to, container selection/modifications, spacecraft fixture and load isolation system design, and fixture-container integration. Code 270 shall use staff expertise to help formulate project requirements and identify the optimum approach to satisfy requirements consistent with project goals and schedules. All government furnished equipment (GFE) is provided "as is" and required modifications are the responsibility of Code **XXX**. Code 270 shall provide the **TBD** Project with formal status updates as required.

Code **XXX** shall provide technical data, drawings, procurement support, final design approvals, and all travel and transportation related expenses. Code **XXX** shall provide funding to accomplish the work and services to be provided to the project as outlined in the MOU and attached task list. The main point-of-contact (POC) for the **TBD** Project Office is **TBD**. The Code 270 main POC is **TBD**.

SPECIFIC RESPONSIBILITIES

Code 270 shall:

1. Supply the **TBD** Transporter to the **TBD** Project as GFE.

2. Provide engineering consulting services, upon request by Code **XXX**, including, but not limited to, container selection/modifications, spacecraft fixture and load isolation system design, and fixture-container integration.

3. Provide procurement support for implementing design modifications to convert the (Project) shipping container into the **TBD** shipping container. If it becomes necessary, Code 270 shall also provide procurement support for any required Environmental Control System (ECS) or trailer modifications and maintenance.

4. Perform transport operations in support of the road test. Code 270 representatives shall accompany the road test and assume responsibility for the transporter during all transportation phases, including installation of shock and vibration instrumentation before departure and the resulting data analysis. Code 270 shall secure all required transport permits, route surveys, and convoy arrangements.

5. Provide additional mini – road tests, as required, to certify the **TBD** transporter's system functionality.

6. Prepare the **TBD** Transportation Plan for spacecraft shipment. The Instrumentation Plan shall be incorporated into the Transportation Plan. Transport and return of all ground support equipment (GSE) shall be clearly documented. The plan shall be approved by Code **XXX**.

7. Deliver the spacecraft and its GSE, as requested by Code XXX, to **TBD**. Code 270 will accompany the transporter and assume responsibility for transportation operations, including installation of shock and vibration instrumentation before departure and the resulting data analysis on-site at **TBD**. Code 270 shall secure all required transport permits, route surveys, and convoy arrangements.

8. Arrange for the return of the **TBD** Transporter and the GSE after launch from **TBD** to GSFC.

Code XXX shall:

1. Provide the **TBD** transportation and environmental technical data requirements, including, but not limited to, applicable spacecraft drawings and models and design thresholds. Code **XXX** will provide all final design approvals, where applicable.

2. Provide the shipping container interface control drawing for the **TBD** spacecraft mass simulator and flight spacecraft.

3. Provide the **TBD** mass simulator for road testing.

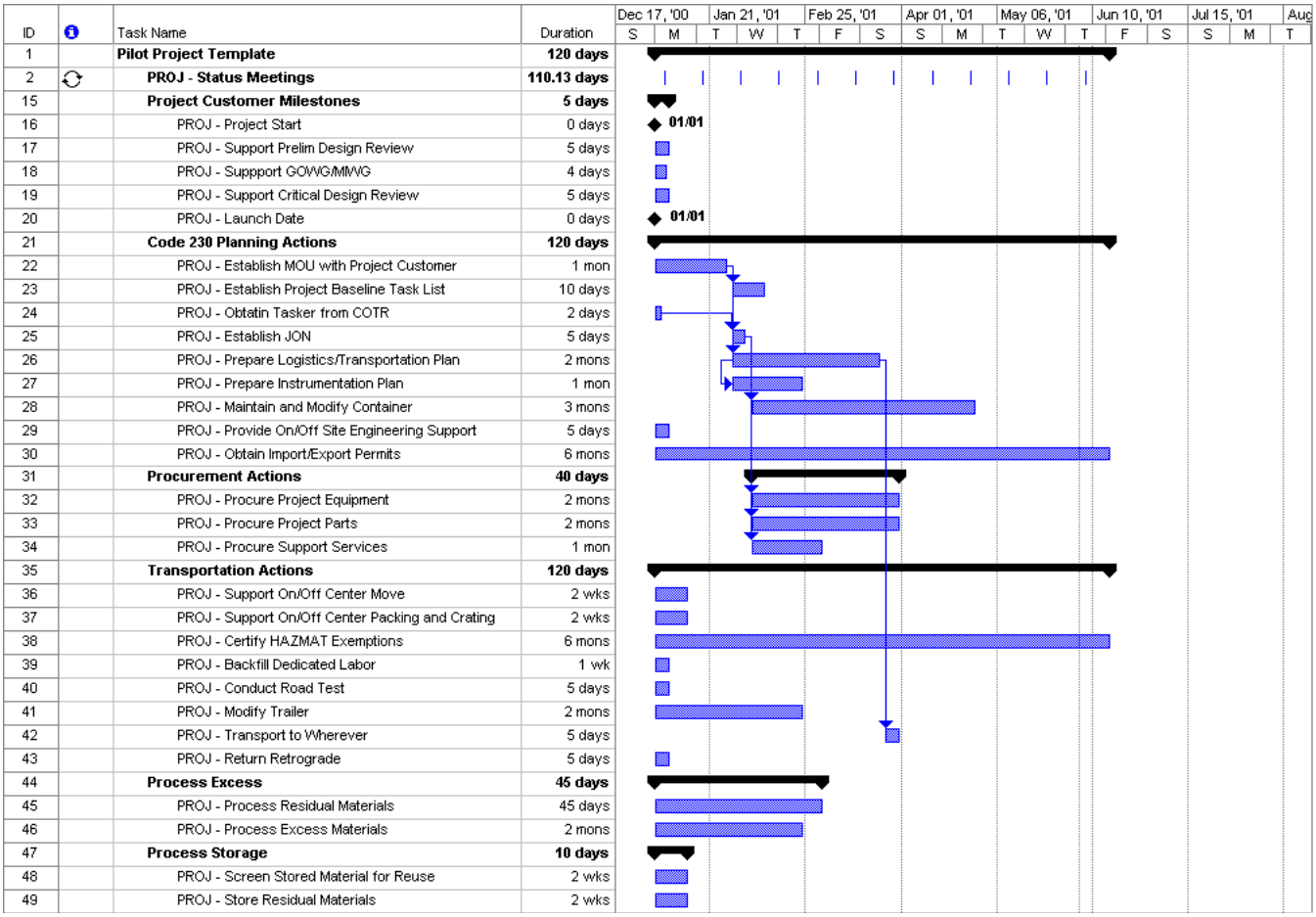
4. Review, evaluate and provide final design approvals on the container and transporter designs, the mechanical load isolation system, the interface fixture and the ECS, in the event that Code 270 consulting services are requested.

5. Provide funding to accomplish the work and services to be provided to the project as outlined in this MOU, including costs of vendor container/trailer modifications and all travel and transportation related expenses.

6. Task additional contractors or organizations to provide support to Code 270 as necessary to complete the tasks defined in this MOU and associated task list.

Attachment 2

Project Schedule *(Sample)*



ID	Task Name	Duration
1	**Pilot Project Template**	**120 days**
2	**PROJ - Status Meetings**	**110.13 days**
15	**Project Customer Milestones**	**5 days**
16	PROJ - Project Start	0 days
17	PROJ - Support Prelim Design Review	5 days
18	PROJ - Suppport GOWG/MMWG	4 days
19	PROJ - Support Critical Design Review	5 days
20	PROJ - Launch Date	0 days
21	**Code 230 Planning Actions**	**120 days**
22	PROJ - Establish MOU with Project Customer	1 mon
23	PROJ - Establish Project Baseline Task List	10 days
24	PROJ - Obtatin Tasker from COTR	2 days
25	PROJ - Establish JON	5 days
26	PROJ - Prepare Logistics/Transportation Plan	2 mons
27	PROJ - Prepare Instrumentation Plan	1 mon
28	PROJ - Maintain and Modify Container	3 mons
29	PROJ - Provide On/Off Site Engineering Support	5 days
30	PROJ - Obtain Import/Export Permits	6 mons
31	**Procurement Actions**	**40 days**
32	PROJ - Procure Project Equipment	2 mons
33	PROJ - Procure Project Parts	2 mons
34	PROJ - Procure Support Services	1 mon
35	**Transportation Actions**	**120 days**
36	PROJ - Support On/Off Center Move	2 wks
37	PROJ - Support On/Off Center Packing and Crating	2 wks
38	PROJ - Certify HAZMAT Exemptions	6 mons
39	PROJ - Backfill Dedicated Labor	1 wk
40	PROJ - Conduct Road Test	5 days
41	PROJ - Modify Trailer	2 mons
42	PROJ - Transport to Wherever	5 days
43	PROJ - Return Retrograde	5 days
44	**Process Excess**	**45 days**
45	PROJ - Process Residual Materials	45 days
46	PROJ - Process Excess Materials	2 mons
47	**Process Storage**	**10 days**
48	PROJ - Screen Stored Material for Reuse	2 wks
49	PROJ - Store Residual Materials	2 wks

CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline	2/26/02	Initial Release
A	2/4/05	• As directed during the FY04 Center Rules Review, the Responsible Office modified this document to remove requirements that were no longer needed and to clearly distinguish requirements from supporting information. Administrative changes were made throughout to correct responsible organization names and codes, and to re-title Goddard Procedures and Guidelines (GPG) to Goddard Procedural Requirements (GPR) and NASA Procedures and Guidelines (NPG) to NASA Procedural Requirements (NPR). • Updated Section 4 "Non-Conformance Management. • Changed "JON" to "Financial Accounting String" throughout the document.
A	5/9/08	• Administrative update to reflect change in owning organization code from 230 to 270.
B	8/8/08	• General update to remove instrumentation responsibilities and procedures, which are now contained in 270-WI-6400.1.1. • General update to remove Microsoft Project as the mandatory scheduling software. • General update to remove mandatory formats for transportation plans, task/action items lists, and trip reports. • General update to replace "integrated logistics support" with "logistics."
C	9/28/12	• Procurement of Project Parts WI 270-WI-510.1.1 cancelled and included in the Procurement WI 270-WI-5100.1.2 • Inspection and Test of Project Parts 270-WI-5330.3.1H cancelled and is now 270-WI-5330.0.1 • General update to add provisions regarding instrumentation calibration and scales calibration programs. Made additions/changes to Section 1.5. Made additions/changes to Section 3.2 part d. Also added "Calibration of weighting devices will be conducted by a commercial vendor." • Modified Section P.7 Training to add Matrix format and new training requirements. • Modified Section P.8 Records to add GSFC 4-34, Nonconforming IMTE Tag. • General updates to reflect changes in current hyperlinks, added to new definitions under parts d. & m of Appendix "A".

Revision	Effective Date	Description of Changes
		• Changed "Definitions" from P.10 to Appendix "A" • Added "Appendix B" - Acronyms
D	9/5/14	• P.6 Safety precautions updated with standardized requirements that only forklifts with overhead guards to lift material to and from elevated racks, and that spotter personnel remain well back from elevated forklift loads. Expanded the requirement for the use of hard hats to from "under" to "under and around" suspended loads. • P.6 Safety precautions standardized requirement for palletized materials stored in elevated racks be in a stable configuration and shrink wrapped when feasible, that palletized material not overhand the edge of the pallet and pallets overhand racks by no more than 3." • Information concerning the calibration process was consolidated into Appendix C